Remarks

Claims 1-11 are pending. Claim 1 is rejected under 35 U.S.C. § 102(b) as being anticipated by Minowa et al. (6,243,637). Claim 2 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Minowa et al. in view of Vilim et al. (5,745,382). Claims 3-5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Minowa et al. in view of Vilim et al. and Narita (5,241,477). Claims 6 and 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Minowa et al. in view of Narita. Claims 7-10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Minowa et al. in view of Narita and Vilim et al.

Claim Rejections – 35 U.S.C. § 102(b)

Claim 1 is rejected under 35 U.S.C. § 102(b) as being anticipated by Minowa et al. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." MPEP § 2131, citing Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (emphasis added).

Minowa et al. teach that, in certain prior art transmissions, shifting occurs "during the interval in which one clutch is disengaged and the other one is engaged." (Minowa et al., column 1, lines 24-25). The transfer torque is determined by the "oil pressure on the engaged clutch," (Minowa et al., column 1, lines 27-29), which in turn is controlled by an "engaged side oil pressure command value," (Minowa et al., column 2, lines 6-9), which in turn is "decided by the values of the required transfer torque of clutch that are determined by the values of the actual turbine torque of torque converter…." (Minowa et al., column 2, lines 37-39). Thus, the transfer torque of the engaged clutch is determined by the actual turbine torque of the torque converter.

According to Minowa et al., "when the engine torque (load) is increased by acceleration operation" (column 2, lines 49-50) the "actual oil pressure does not immediately follow a new oil pressure command value that has been determined on the basis of the increased turbine torque" (column 2, lines 56-59). This delay between actual oil pressure and a new oil pressure command causes "unnecessary slip of clutch to occur." (column 2, line 61).

The purpose of Minowa et al. is to prevent this "unnecessary slip." The solution proposed by Minowa et al. is a control apparatus in which "an oil pressure command value acting on the clutch is determined in accordance with [a] … computed transfer torque" (column 3, lines 6-8) based on engine load so that "even if the actual engine torque is abruptly changed during the gear shifting, the oil pressure acting on the clutches can be correctly controlled with good response … and the clutches can be prevented from being worn away by slipping" (column 3, lines 25-30). Thus, Minowa et al. disclose determining a pressure command value based on a computed transfer torque based on engine load to avoid slippage.

Claim 1 of the present application recites "controlling the off-going clutch using closed loop control to maintain a predetermined slip threshold." (emphasis added). The Examiner states that "Minowa et al shows … controlling the off-going clutch using closed loop control to maintain a predetermined slip threshold (Column [sic], lines 59-63 where slip range is confined by turbine torque, oil pressure: Column 3, lines 25-30; Column 6 , [sic] lines 66-Column 7, lines 30)…."

Applicants note that the first textual reference cited by the Examiner includes lines 59-63, but does not include a column number. Applicants have reviewed lines 59-63 of all columns in Minowa et al., and it appears that the Examiner intended to cite lines 59-63 of column 2, which recite that "[w]hen the oil pressure is not raised enough relative to the increased turbine torque, the transfer torque of clutch is insufficient, allowing unnecessary slip of clutch to occur." Minowa et al. at column 2, lines 59-63 merely state that slip occurs when oil pressure is too low compared to turbine torque, and not "controlling the off-going clutch using closed loop control to maintain a predetermined slip threshold," as recited by claim 1.

Column 3, lines 25-30, also cited by the Examiner, merely states, in relevant part, that "the oil pressure acting on the clutches can be correctly controlled with good response to satisfy the shift control program, and the clutches can be prevented from being worn away by slipping." Again, this is not the equivalent of "controlling the off-going clutch using closed loop control to maintain a predetermined slip threshold," as recited by claim 1. As noted above,

Minowa et al. disclose that the oil pressure acting on a clutch is controlled in accordance with a computed transfer torque in order to avoid slipping, not to "maintain a predetermined slip threshold" as recited by claim 1.

Column 6, line 66 - Column 7, line 30, which is further cited by the Examiner, merely describes changing an oncoming oil pressure command value in accordance with a control parameter "corresponding to the engine load" (column 7, lines 14-17). There is no disclosure of "controlling the off-going clutch using closed loop control to maintain a predetermined slip threshold," as recited by claim 1.

It should be noted that Minowa et al. disclose controlling the "engaged side" oil pressure command, which is an oncoming clutch pressure command, whereas claim 1 recites "controlling the offgoing clutch."

Claim 1 further recites "determining the first derivative with respect to time of at least a portion of the off-going clutch pressure command." The Examiner states that Minowa et al. disclose "determining the first derivative with respect to time of at least a portion of the off-going clutch pressure command (Column 9 , lines 55 – Column 10, lines 40); and determining when the on-coming clutch gained torque capacity using the first derivative…." Minowa et al. at column 9, lines 55 – column 10, line 40 disclose determining the derivative with respect to time of the "accelerator pedal angle α, or $d\alpha/dt$." Minowa et al. do not disclose "determining the first derivative with respect to time of at least a portion of the off-going clutch pressure command," as recited by claim 1.

Accordingly, claim 1 recites several elements and limitations that are not disclosed, expressly or inherently, by Minowa et al., and therefore the rejection of claim 1 under 35 U.S.C. § 102(b) is improper.

Claim Rejections – 35 U.S.C. § 103(a)

Claim 2 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Minowa et al. in view of Vilim et al. (5,745,382). Claim 2 depends from claim 1 and therefore

incorporates all of the elements and limitations of claim 1. In the rejection of claim 2, the Examiner relies upon Minowa et al. for all of the elements and limitations of claim 1. However, as noted above, Minowa et al. do not disclose several elements and limitations of claim 1. Vilim does not teach or suggest the elements and limitations of claim 1 missing from Minowa et al., and indeed, Vilim et al. does not even address clutch control in a transmission. Accordingly, the rejection of claim 2 is improper for at least this reason.

Claims 3-5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Minowa et al. in view of Vilim et al. and Narita (5,241,477). Claims 3-5 ultimately depend from claim 1 and therefore incorporate all of the elements and limitations of claim 1. In the rejection of claims 3-5, the Examiner relies upon Minowa et al. for all of the elements and limitations of claim 1. As noted above, Minowa et al. do not disclose several elements and limitations of claim 1, and Vilim et al. and Narita do not teach or suggest the elements and limitations of claim 1 that are missing from Minowa et al. For this reason alone, the rejection of claims 3-5 is improper.

Claims 3-5 also recite elements and limitations that are not taught or suggested by any of the references cited by the Examiner. However, because the rejection of claims 3-5 is clearly improper for the reasons provided above, further analysis is not necessary.

Claims 6 and 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Minowa et al. in view of Narita. Claim 6 recites "wherein the controller is programmed and configured to control the off-going clutch during the shift event using closed loop control to maintain the predetermined slip threshold by generating an off-going clutch pressure command to which the first clutch is responsive and that varies with respect to time; … wherein the controller is programmed and configured to determine the first derivative with respect to time of at least a portion of the off-going clutch pressure command."

The Examiner states that "Narita shows … [that] the controller is programmed and configured to control the off-going clutch during the shift event using closed loop control to maintain the predetermined slip threshold by generating an off-going clutch pressure command … (Fig 12, Column 2, lines 1 -15; Column 2, line s64 [sic] – Column 3, lines 8; Column 6, lines

32-35; Fig 10, Column 9, lines 55- Column 10, lines 40)." Applicants have carefully reviewed Narita, with particular attention to the text cited by the Examiner, and find no disclosure of a controller "programmed and configured to control the off-going clutch during the shift event using closed loop control to maintain the predetermined slip threshold," as recited by claim 6. Indeed, the word "slip" is not used at all in the disclosure of Narita.

The Examiner further states that "Narita shows … [that] the controller is programmed and configured to determine the first derivative with respect to time of at least a portion of the off-going clutch pressure command (Column 9 ,lines [sic] 55 – Column 10, lines 40)." The text of Narita cited by the Examiner, i.e., column 9, line 55 – column 10, line 40, discloses employing "the first time derivative of gear ratio G" (emphasis added); Narita does not disclose determining "the first derivative with respect to time of at least a portion of the off-going clutch pressure command," as recited by claim 6.

Accordingly, claim 6 recites elements and limitations that are neither taught nor suggested by the references cited by the Examiner, and therefore the rejection of claim 6 is improper.

Furthermore, as an apparent reason to combine the teachings of Minowa et al. and Narita, the Examiner states "[i]t would have been obvious … to provide the automatic transmission system of Minowa et al with the control command, as taught by Narita, because the use of speed ratio from input and output shaft with respect to slip threshold and the derivative with respect to fluid for determining the clutch engage and disengage and the use of closed loop feedback control system utilizing computer program is well commonly known in the art."

The Examiner's apparent reason is not readily understood, and does not appear to be relevant to the claimed invention. The phrase "derivative with respect to fluid" is, respectfully, not comprehendible. Claim 6 recites a controller that is "programmed and configured to determine the first derivative with respect to time of at least a portion of the off-going clutch pressure command," not the "derivative with respect to fluid."

Furthermore, with respect to the Examiner's statement that these are "well commonly known in the art," Applicants respectfully refer the Examiner to MPEP § 2144.03, which, which recites, *inter alia*, "[o]rdinarily, there must be some form of evidence in the record to support an assertion of common knowledge. See *Lee*, 277 F.3d at 1344-45, 61 USPQ2d at 1434-35 (Fed. Cir. 2002); *Zurko*, 258 F.3d at 1386, 59 USPQ2d at 1697 (holding that general conclusions concerning what is "basic knowledge" or "common sense" to one of ordinary skill in the art without specific factual findings and some concrete evidence in the record to support these findings will not support an obviousness rejection)." (emphasis added).

MPEP § 2144.03 further recites that "[t]he examiner must provide specific factual findings predicated on sound technical and scientific reasoning to support his or her conclusion of common knowledge. See *Soli*, 317 F.2d at 946, 37 USPQ at 801; *Chevenard*, 139 F.2d at 713, 60 USPQ at 241." (emphasis added). The Examiner has not provided specific factual findings, nor has the Examiner provided technical or scientific reasoning to support the conclusion of common knowledge. Accordingly, the Examiner's rejection of claim 6 is improper. If the Examiner maintains the position that "the use of speed ratio from input and output shaft with respect to slip threshold and the derivative with respect to fluid for determining the clutch engage and disengage and the use of closed loop feedback control system utilizing computer program is well commonly known in the art," then Applicants respectfully request that the Examiner provide documentary evidence in support of that position.

Claim 11 recites "controlling the off-going clutch using closed loop control to maintain a predetermined slip threshold." As noted above with respect to claim 6, Minowa et al. and Narita fail to disclose controlling an off-going clutch to maintain a predetermined slip threshold, and therefore the rejection of claim 11 is improper. Claim 11 also recites "determining the first derivative with respect to time of at least a portion of the off-going clutch pressure command, said first derivative being characterized by local minima and maxima." As noted above with respect to claim 6, Minowa et al. and Narita fail to disclose determining the first derivative with respect to time of an off-going clutch pressure command. In the rejection of claim 11, the Examiner states that "Narita shows first derivative being characterized by local minima and maxima (Column 7, lines 5-10 where the data points are plotted with respect to

recorded time in Fig 11; Column 2, lines 14-15)…." Narita states, at column 7, lines 5-10, that "the maximum and minimum of the output shaft torque are given by and stored as T_oPlus and T_oMinus, respectively. The maximum and minimum of the output shaft torque are used in the sub routine of FIG. 8." (emphasis added). Thus, Narita discloses the maximum and minimum values of the output shaft torque, not the local maxima and minima of the "first derivative with respect to time of at least a portion of the off-going clutch pressure command," as recited by claim 11. Accordingly, the rejection of claim 11 is improper.

Furthermore, the Examiner states that it would have been obvious to "provide a first derivative technique to measure local maxima and minima to Minowa et al, as taught by Narita, since first derivative provides torque peak or down by local maxima and minima as the rate of change." This reason, as understood, is not relevant because none of the references cited disclose the first derivative of an offgoing clutch pressure command.

Claims 7-10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Minowa et al. in view of Narita and Vilim et al. Claims 7-10 ultimately depend from claim 6, and therefore incorporate all of the elements and limitations of claim 6. As noted above, none of the references cited by the Examiner teach or suggest all of the limitations of claim 6. Accordingly, the rejections of claims 7-10 are improper for at least the same reasons that the rejection of claim 6 is improper.

Furthermore, in the rejection of claim 8, the Examiner states that "[i]t would have been obvious for one of ordinary skill in the art to provide a commonly well known first derivative technique to measure local maxima and minima…." MPEP § 2144.03 recites that "[t]he examiner must provide specific factual findings predicated on sound technical and scientific reasoning to support his or her conclusion of common knowledge. See *Soli*, 317 F.2d at 946, 37 USPQ at 801; *Chevenard*, 139 F.2d at 713, 60 USPQ at 241." (emphasis added). The Examiner has not provided specific factual findings, nor has the Examiner provided technical or scientific reasoning to support the conclusion that a "first derivative technique to measure local maxima and minima" is well known, and therefore the rejection is improper. If the Examiner maintains the position that a "first derivative technique to measure local maxima and minima" is

"commonly well known," then Applicants request that the Examiner provide documentary evidence.

Conclusion

This reply is believed to be fully responsive to the Office Action mailed August 29, 2007. The remarks are believed to place this application in condition for allowance, which action is respectfully requested.

Respectfully submitted,

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